AMENDMENTS TO THE CLAIMS

1-104. (Canceled)

1. A method for laser micro-capture comprising:

providing a laser micro-capture instrument having at least one laser source;

providing a sample for micro-capture;

placing the sample in an optical path of the laser source;

providing a transfer film; the transfer film including at least one expansion layer and one outer adhesive layer; the adhesive layer being coupled to one side of the expansion layer;

placing the transfer film in the optical path of the laser source such that the adhesive layer is located between the expansion layer and the sample;

selecting a portion of the sample for micro-capture;

exposing the transfer film to energy from the laser source to expand the expansion layer and to exert a force upon the adhesive layer thereby deflecting the transfer film towards the selected portion of the sample to adhere the adhesive layer to the selected portion of the sample for micro-capture of the selected portion; and

isolating the selected portion of the sample.

2. The method of claim 1 wherein the step of providing a transfer film further includes providing a transfer film wherein the expansion layer is thermally coupled to at least one energy absorbing substance.

3. The method of claim 1 wherein the step of providing a transfer film further includes providing a transfer film wherein at least one energy absorbing substance is thermally coupled to the expansion layer, and at least one energy absorbing substance is thermally coupled to the adhesive layer.

4. The method of claim 1 further including the step of exposing the transfer film to energy from the laser source to expand the adhesive layer deflecting the transfer film towards the selected portion of the sample to adhere the adhesive layer to the selected portion of the sample for micro-capture of the selected portion of the sample.

5. The method of claim 2 or 3 wherein the step of exposing the transfer film to energy from the laser source to expand the expansion layer includes exposing the transfer film to energy adapted to be absorbed by the at least one energy absorbing substance that is thermally coupled to the expansion layer thereby deflecting the transfer film towards the sample.

6. The method of claim 4 wherein the step of providing a transfer film includes providing a transfer film wherein at least one energy absorbing substance is thermally coupled to the adhesive layer; and wherein the step of exposing the transfer film to energy from the laser source to expand the adhesive layer includes exposing the transfer film to energy adapted to be absorbed by the at least one energy absorbing substance that is thermally coupled to the adhesive layer thereby deflecting the transfer film towards the sample.

7. The method of claim 2 or 3 further including the step of forming at least one concentration gradient of the at least one energy absorbing substance in the adhesive layer or the expansion layer.

8. The method of claim 2 or 3 wherein the step of providing a transfer film includes providing a transfer film wherein the at least one energy absorbing substance coupled to the expansion layer and the at least one energy absorbing substance coupled to the adhesive layer are independently addressable, spectrally selective energy-absorbing substances.

9. The method of claim 1 wherein the step of providing a transfer film includes providing a transfer film that includes a retraction layer.

10. A method for laser micro-capture comprising:

providing a laser micro-capture instrument having at least one laser source;

providing a sample for micro-capture;

placing the sample in an optical path of the laser source;

providing a transfer film;

selecting a portion of the sample for micro-capture;

exposing the transfer film to a first pulse of energy directed at the selected portion of the sample;

exposing the transfer film to a second pulse of energy directed at the selected portion of the sample;

contacting the portion of the sample with the transfer film;

adhering the transfer film to the portion of the sample;

isolating the selected portion of the sample from the remainder of the sample.

11. The method of claim 10 wherein the step of providing a transfer film includes providing a transfer film comprising an expansion layer and an adhesive layer; the adhesive layer being coupled to one side of the expansion layer.

12. The method of claim 11 wherein the step of exposing the transfer film to a first pulse of a first energy includes exposing the expansion layer.

13. The method of claim 11 wherein the step of exposing the transfer film to a second pulse of a second energy includes exposing the adhesive layer or the expansion layer.

14. The method of claim 10 wherein the first pulse and the second pulse is the same of the same wavelength.

15. The method of claim 10 wherein the step of providing a transfer film further includes providing a transfer film including at least one energy absorbing substance thermally coupled to the transfer film.

16. The method of claim 15 wherein the step of providing a transfer film including at least one energy absorbing substance thermally coupled to the transfer film includes providing a transfer film including at least one energy absorbing substance selected from the group consisting of energy absorbing dyes, metal films, polymer nano-composites, particulates and Buckminsterfullerene.

17. The method of claim 15 wherein the wavelength of the first pulse of energy is selected to be absorbed by at least a first energy absorbing substance and the wavelength of the second pulse of energy is selected to be absorbed by at least a second energy absorbing substance.

18. The method of claim 10 wherein the step of exposing the transfer film to a first pulse of a energy directed at the selected portion of the sample includes exposing the transfer film to deflect the transfer film a first distance towards the selected portion of the sample.

19. The method of claim 10 or 18 wherein the step of exposing the transfer film to a second pulse of a energy directed at the selected portion of the sample includes exposing the transfer film to deflect the transfer film a second distance towards the selected portion of the sample.

20. A transfer film for laser micro-capture of a sample comprising:

at least one layer having a first side and a second side; the first side being adapted for contact with a sample; the transfer film being adapted to absorb energy to form a temperature gradient such that the first side has a lower temperature relative to the second side.

21. The method of claim 21 wherein the layer includes a polymer selected from the group consisting of thermosets, thermoplastics, and elastomers.

22. The method of claim 20 wherein the layer includes at least one energy absorbing substance distributed in the layer such that the energy absorbing substance is more concentrated adjacent to the second side relative to the first side.

23. The method of claim 22 wherein the at least one energy absorbing substance is selected from the group consisting of energy absorbing dyes, metal films, polymer nano-composites, particulate matter, and Buckminsterfullerene.

24. The method of claim 20 wherein the layer includes at least one expansion layer and an adhesive layer; the adhesive layer being coupled to one side of the expansion layer such that the adhesive layer is at the first side and the expansion layer is at the second side; the expansion layer being adapted to absorb energy incident upon the transfer film and to expand to exert a force upon the adhesive layer such that the adhesive layer is deflected towards the sample; the adhesive layer being adapted to adhere to the selected portion of the sample for micro-capture.

25. The method of claim 24 wherein the adhesive layer includes at least one pressure sensitive adhesive.

26. The method of claim 24 wherein the expansion layer is thermally coupled to at least one energy absorbing substance.

27. The method of claim 24 wherein the expansion layer is doped with at least one energy absorbing substance and the adhesive layer is not doped.

28. The method of claim 24 wherein the expansion layer and the adhesive layer includes a polymer selected from the group consisting of thermosets, thermoplastics, and elastomers.